Kansas Agricultural Experiment Station Research Reports

Volume 3
Issue 4 *Turfgrass Research*

Article 11

7-2017

Evaluating Zoysiagrass-Tall Fescue Mixtures in Kansas

Mingying Xiang
Kansas State University, mxiang@ksu.edu

J. Fry
Kansas State University, jfry@ksu.edu

M. Kennelly
Kansas State University, kennelly@ksu.edu

Evaluating Zoysiagrass-Tall Fescue Mixtures in Kansas

Abstract

Water conservation is increasingly important when selecting turfgrasses. Zoysiagrass (*Zoysia japonica*), a C4 grass, is more drought resistant than C3 grasses. However, there is some resistance to the use of zoysiagrass in lawns and golf courses due to its extended dormant period when turf is brown. The objective of this study was to evaluate mowing height, tall fescue seeding rate and time for establishment of a mixed stand with seeded zoysiagrass. Seeding zoysiagrass and tall fescue together in June generally resulted in a less uniform mixture than seeding zoysiagrass in June and then seeding tall fescue in September. Tall fescue seeded in September at 8 lb pure live seed/1,000 ft^2 resulted in the most uniform mixture of the two species.

Keywords

Turfgrass, ecology, management

TURFGRASS RESEARCH
2017

K-STATE TURFGRASS RESEARCH

JULY 2017

Evaluating Zoysiagrass-Tall Fescue Mixtures in Kansas

Mingying Xiang, Jack Fry, and Megan Kennelly

Summary. Water conservation is increasingly important when selecting turfgrasses. Zoysiagrass (*Zoysia japonica*), a C4 grass, is more drought resistant than C3 grasses. However, there is some resistance to the use of zoysiagrass in lawns and golf courses due to its extended dormant period when turf is brown. The objective of this study was to evaluate mowing height, tall fescue seeding rate and time for establishment of a mixed stand with seeded zoysiagrass. Seeding zoysiagrass and tall fescue together in June generally resulted in a less uniform mixture than seeding zoysiagrass in June and then seeding tall fescue in September. Tall fescue seeded in September at 8 lb pure live seed/1,000 ft^2 resulted in the most uniform mixture of the two species.

Rationale. Water conservation is an increasingly important factor when selecting turfgrasses for use in the landscape. Zoysiagrass (*Zoysia japonica*), a warm-season grass, is more drought resistant than cool-season grasses. However, there is resistance on the part of homeowners, and some golf course managers, to use zoysiagrass due to its extended period of brown color when dormant, which is longer than cool-season grasses.

Mixing zoysiagrass with a cool-season grass, such as tall fescue (*Schedonorus arundinaceus*), to establish a perennial sward has several potential advantages. First, tall fescue enhances late fall and early spring color of the sward while zoysiagrass provides quality during periods of drought stress. In addition, a mixture will allow adaptation across a range of environmental conditions and enhanced resistance to biotic pests. Therefore, this mixture may provide a quality sward, allowing reduced irrigation, fertilizer, and pesticide inputs compared to monostands of either species. This combination also maintains acceptable visual color in autumn and early spring when zoysiagrass monostands exhibit a brown, dormant color.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

K-STATE TURFGRASS RESEARCH

Objectives. The objectives of this research were to evaluate the effects of mowing height and 'Corona' tall fescue seeding time and rate on establishment of a perennial mixed sward with 'Compadre' zoysiagrass in Kansas.

Study Description. A field study was initiated in July 2015 at the Kansas State University Rocky Ford Turfgrass Research Center in Manhattan, KS. Plots were arranged in a split-plot design, with mowing height (0.75 or 2 inches, representing fairway and lawn height, respectively) as the whole plot. Sub-plots consisted of timing and rate of tall fescue seeding. Whole plots measured 10 × 15 ft and were replicated four times. Sub plots were 5 × 5 ft, and there were six sub-plot replicates within each whole plot. At Rocky Ford, 'Compadre' zoysiagrass was seeded in all plots at 1 lb of pure live seed (PLS)/1,000 ft^2 on June 9, 2015. 'Corona' tall fescue was seeded at differing times and rates as the sub-plot treatments: 1) June, at the same time zoysiagrass was seeded; and 2) in September into the established stand of zoysiagrass. Data were collected on visual turf quality each week on a 1 to 9 scale (1 = poorest color, density, and uniformity; 6 = minimum acceptable quality; 9 = optimum color, density, and uniformity) and fall color (on a 1 to 9 scale, 1 = brown and 9 = dark green). Tall fescue incidence was determined in December, when zoysiagrass had lost all green color, by counting the presence of tall fescue under a 196-intersection grid that measured 4.6 × 4.6 ft with 2.5 inches between each of 14 gridlines in either direction (% tall fescue incidence = tall fescue frequency/196 × 100). Percentage of tall fescue cover in December was also determined using digital image analysis. All data were subjected to analysis of variance using the GLIMMIX procedure of SAS 9.4 (SAS Institute Inc., Cary, NC). Fisher's protected least significant difference (LSD) ($P \leq 0.05$) was used to detect treatment differences.

Results. A significant mowing height × timing of seeding interaction and a significant rate effect were observed on tall fescue incidence (%) determined using the grid. Seeding tall fescue in September resulted in higher incidence of this species at both mowing heights (Figure 1). Furthermore, seeding tall fescue at 8 lb PLS/1,000 ft^2 provided higher tall fescue incidence compared to other seeding rates (Figure 2), and this resulted in better late fall and early spring color.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

K-STATE TURFGRASS RESEARCH

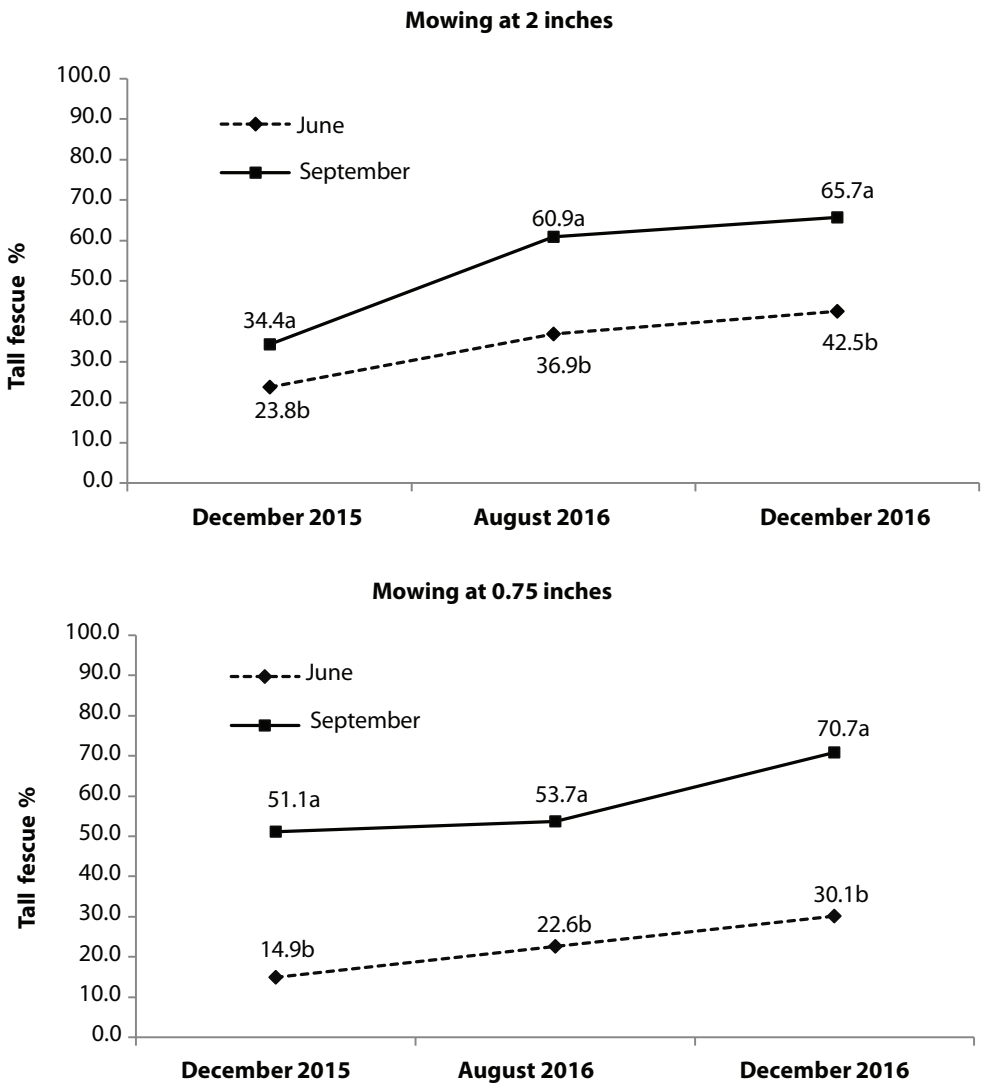


Figure 1. Effects of mowing height and time of seeding on tall fescue incidence. On each date, means followed by the same letter are not significantly different ($P \leq 0.05$).

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

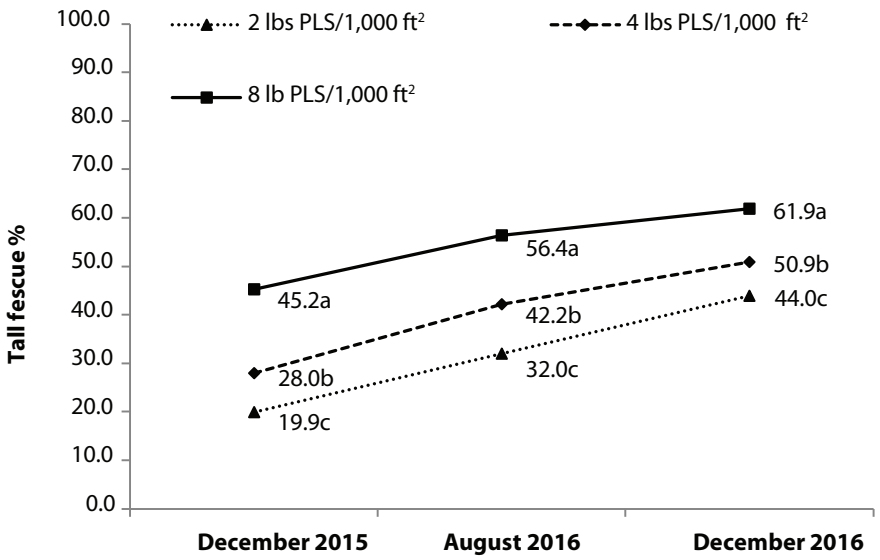


Figure 2. Effects of seeding rate on tall fescue incidence. Within each date, means with the same letters are not significantly different ($P \leq 0.05$). PLS = pure live seed.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service

K-STATE TURFGRASS RESEARCH

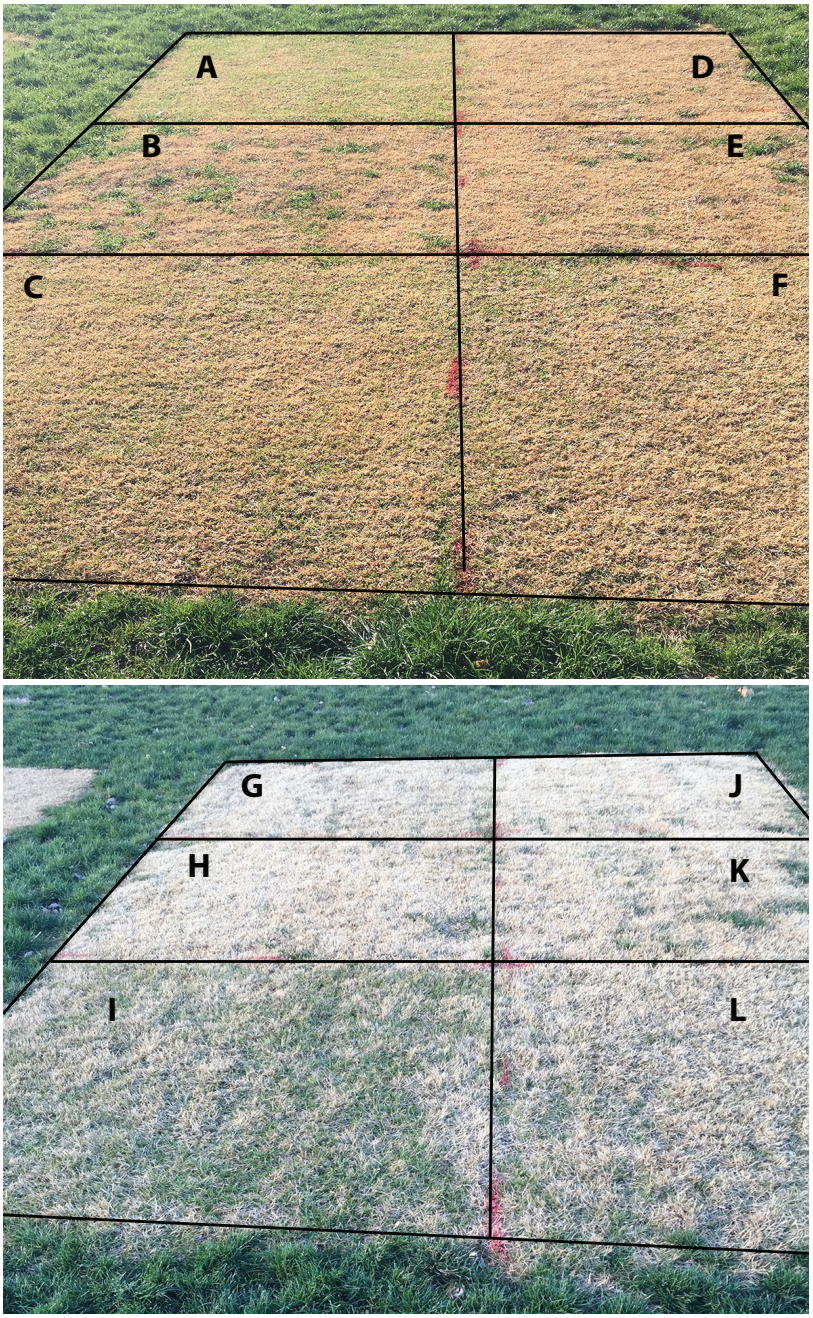
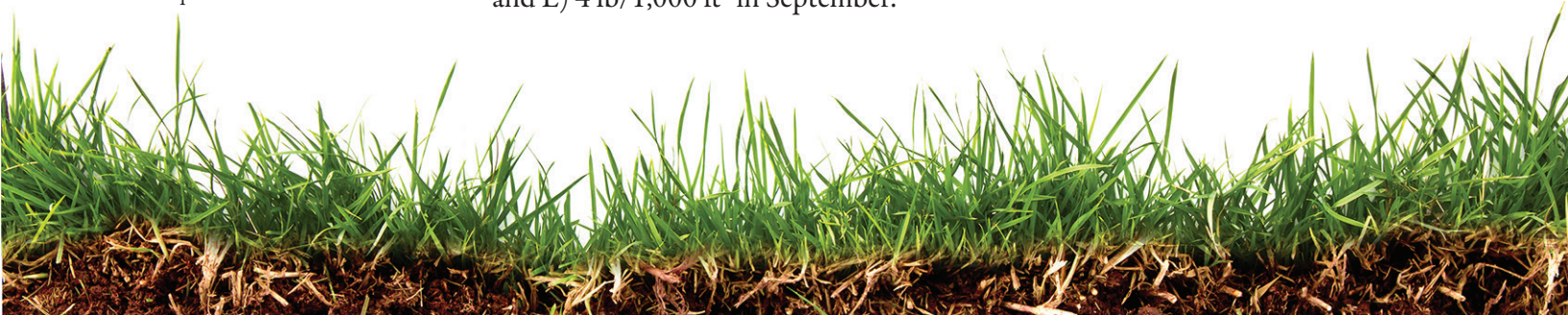


Figure 3. Study area at the Rocky Ford Research Center in Manhattan, KS, on December 4, 2015.
Top image: A-F at 0.75 inches mowing height. All plots seeded with 1 lb/1,000 ft^2 zoysia in June. Tall fescue seeding: A) 8 lb/1,000 ft^2 in September; B) 8 lb/1,000 ft^2 in June; C) 4 lb/1,000 ft^2 in September; D) 2 lb/1,000 ft^2 in June; E) 4 lb/1,000 ft^2 in June; and F) 2 lb/1,000 ft^2 in September.
Bottom image: G-L at 2 inches mowing height. All plots seeded with 1 lb/1,000 ft^2 zoysia in June. Tall fescue seeding: G) 2 lb/1,000 ft^2 in September; H) 2 lb/1,000 ft^2 in June; I) 8 lb/1,000 ft^2 in September; J) 4 lb/1,000 ft^2 in June; K) 8 lb/1,000 ft^2 in June; and L) 4 lb/1,000 ft^2 in September.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service



K-STATE TURFGRASS RESEARCH

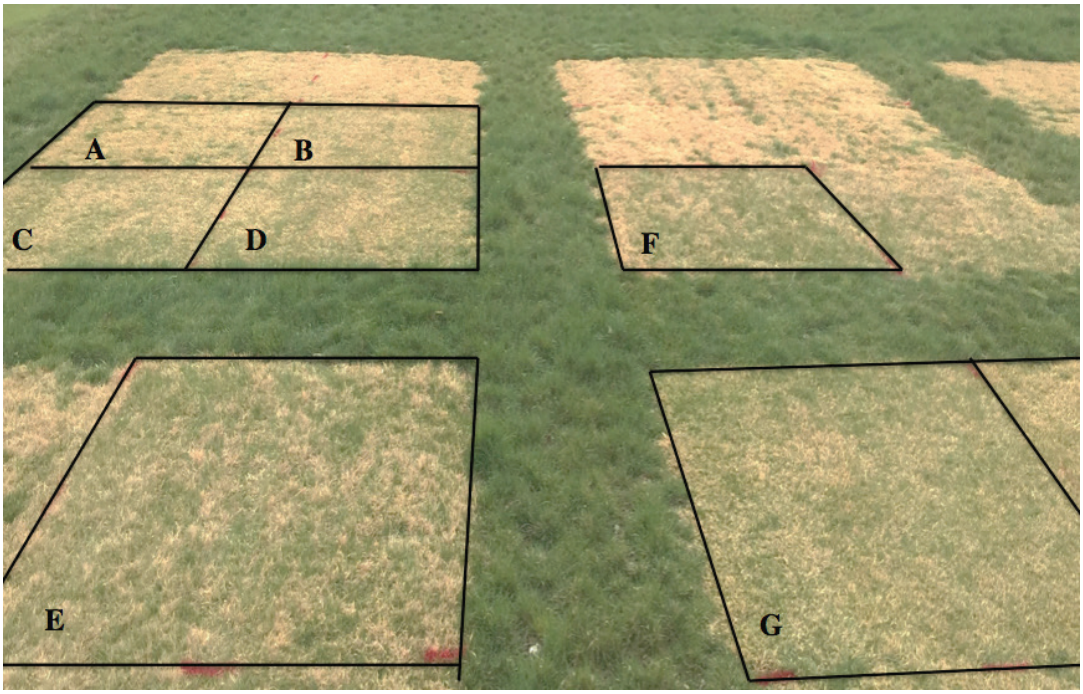


Figure 4. Study area at the Rocky Ford Research Center in Manhattan, KS, on March 31, 2016.
All plots seeded with 1 lb/1,000 ft^2 zoysia in June. Tall fescue seeding: A) 8 lb/1,000 ft^2 in June at 0.75 inches mowing height; B) 8 lb/1,000 ft^2 in September at 0.75 inches mowing height; C) 2 lb/1,000 ft^2 in September at 0.75 inches mowing height; D) 4 lb/1,000 ft^2 in September at 0.75 inches mowing height; E) 8 lb/1,000 ft^2 in September at 2 inches mowing height; and F) 8 lb/1,000 ft^2 in September at 2 inches mowing height; and G) 8 lb/1,000 ft^2 in September at 0.75 inches mowing height.

K-STATE Research and Extension

Kansas State University
Agricultural Experiment Station
and Cooperative Extension Service